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ORIGINAL ARTICLES.

TWO CASES OF IRITIS IN THE COURSE OF BRIGHT'S DISEASE.

By Adolf Alt, M. D.,

ST. LOUIS, MO.

THE paper (June number of this journal) in which Dr. Semple related his experience with a case of iridocyclitis in Bright's disease, prompts the publication of the following two similar cases which I had occasion to observe.

Case No. 1.—W. G. F., who had been under my observation for 6 years on account of a refractive error, reported to me in great anxiety on Jan. 24, 1900, on account of a pronounced loss of vision in both eyes, which he thought he had first noticed some 3 weeks previously, but it had since grown worse. The patient was now 47 years of age, a strong, powerful, well-built man, apparently the very picture of manly vigor. He had no other complaints to offer. I found vision, which heretofore, with the proper correction, had been normal, except for a period of several weeks in which he suffered from what I had thought to be tobacco amblyopia in July, 1899, to be reduced to 20/100 in the right eye and to 20/50

in the left eye. The pupils reacted pretty promptly. An ophthalmoscopic examination revealed in the right eye a considerably swollen and clouded papilla, very broad and tortuous retinal veins and a number of white patches and small hæmorrhages in the upper part of the retina and near the macula lutea. In the left eye the swelling of the papilla was not so great and there was only one white patch in the lower part of the retina. The retinal bloodvessels were about the same as in the right eye. A rapid examination of the urine revealed a trace of albumen. I sent the patient to his family physician with a letter giving my diagnosis. The gentleman flatly contradicted and ridiculed it.

On Feb. 21, I saw the patient again. Vision was now R. 18/200 and L. 20/70. The albuminuric neuroretinitic symptoms were more pronounced than at the previous visit. Still, his physician could find nothing to substantiate my diagnosis, although the pulse was hard and high.

When I saw the patient on March 30, his vision was reduced to 16/200 in either eye. Both papillæ were very indistinct in outline and swollen; there were also a number of glistening white retinal patches and small striped hæmorrhages added to the old ones.

I now reluctantly suggested to him to consult somebody else about his undoubted kidney affection. He finally did so, and returned to me, on April 6, with a letter from the late Dr. Dérivaux, who not only concurred with me in the diagnosis, but stated that he had found a considerable quantity of albumen, and had placed the patient at once on a well reguated diet, etc.

On May 5, I was asked to call at the patient's house, because he "had become blind and had excruciating pain in his eyes." I found a great amount of chemosis of both conjunctivæ, so that the conjunctivæ protruded through the palpebral fissures. When, after considerable difficulty, I finally succeeded in inspecting the eyes, I found a plastic iritis in both, the left pupil being perfectly occluded by a whitish exudation. Vision reduced to 2/200.

Vigorous instillations of atropine began to succeed in dilating the pupils the next day, and in about 4 weeks the

iritis and all its symptoms had disappeared. At that time I was greatly astonished to find, also, that his discs and retinæ were very much improved and vision again as good as it had been on Feb. 21.

The further history of the case I know only from his physicians, Drs. Dérivaux and Baumgarten, as I saw the patient only two or three times during the last few months of his life.

Patient died in March, 1901, just about 14 months after I had first made the diagnosis of retinitis albuminurica, of shrunken kidneys.

As I have stated above, he had been under my treatment in July, 1899, for what I then had, in the absence of any other symptom, and knowing the patient's habits, considered to be an amblyopia due to anæmia of both discs and retinæ from the abuse of tobacco and, possibly, alkohol. True, this condition yielded very promptly to the exhibition of large doses of strychnia and abstinence, yet, I cannot help but think that this was, perhaps, the first eyesymptom of his kidney trouble, and that, in future, it would be well to pay some attention to the urine in doubtful cases of amblyopia—even when the patient's habits seem to give an easy explanation.

Case No. 2.—On June 30, 1899, C. A. F., a very stout, heavy-set man, brewer by trade, called on me to have his beginning presbyopia corrected. At that time the fundus was absolutely normal in either eye.

On Jan. 11, 1901, I was again consulted by him on account of loss of vision, which, although first noticed several months previously, had only now grown bad enough to bring him to an examination.

I found vision in the right eye 20/70, and in the left, 20/200. Ophthalmoscopically the right eye showed a swollen papilla with blurred outlines, veins tortuous and several small white patches near the macula lutea. In the left eye the papilla was considerably more swollen, its outlines invisible on account of exudation, and several large white patches and striped hæmorrhages in the outer half of the retina, with an indefinite star-like figure in the macular region.

My diagnosis of retinitis albuminurica was not only con-

curred in by his physician, Dr. J. B. Ross, but I was informed that the patient had been under treatment for albuminuria and heart disease for a number of months.

During the next 8 months I had occasion to examine the patient a number of times and found that, under the careful management of his case, he not only seemed to hold his own, but, although there was very little change to be seen in the fundus, I even found his vision at one time improved to 20/50 in the right and 20/100 in the left eye. This, however, did not last long.

On Dec. 12, 1901, I was called to the patient's house on account of his eyes having suddenly grown much worse. I found him in a miserable condition, sitting outside the bed suffering with œdema of both legs and gasping for breath. He complained of inability to see and severe pain in both eyes. There was chemosis, especially in the left eye and plastic iritis with numerous posterior synechiæ in both eyes. The intense pain subsided when finally the pupils had become fully dilated by atropine. The attack of iritis lasted barely 2 weeks when the eyes had resumed their previous condition.

I never saw the patient after this, as he died about 6 weeks later.

I need hardly refer to the scanty literature on the subject. To me it does not at all seem astonishing that we should meet with iritis in a disease in which the blood is vitiated as it is in Bright's disease. On the contrary, it is rather astonishing that we do not meet more frequently with these cases. Yet, I have so far only met with these two cases, in both of which the iritis appeared considerably later than the retinal symptoms due to Bright's disease.

In contradistinction to Dr. Semple's case, in which the iritis (or rather iridocyclitis) got well and the patient apparently also, my two cases emphasize the well-known fact that such patients but seldom live more than two years after the retinal signs of Bright's disease have made their appearance. In my first case the time was even considerably shorter.

As we acknowledge the existence of a diabetic and syphil-

itic, rheumatic and gouty iritis, we cannot deny the fact that there is also a Brightic or albuminuric iritis.

I might add here that I have under my observation a case of a very insidious iritis, which is not painful, in a gentleman, aged 55, suffering from lymphatic leukæmia. This iritis, also, developed some 6 months after I had first seen the case on account of leukæmic retinitis. The analogy to the previous cases is striking.

It does not seem that these forms of iritis have any decided symptoms by which we might distinguish them from other forms of iritis, although a more frequent observation of such cases may, perhaps, later on make it possible to find differentiating symptoms.

At least, I did not think that my cases offered anything pecular in their aspect or in their course.

NOTES ON A CASE OF GUMMA OF THE OPTIC NERVE.

By Adolf Alt, M. D.,

ST. LOUIS, MO.

GUMMATA have been described as situated in almost all of the tissues of the eyeball. A gumma in the optic nerve seems so far not to have been seen or described. At least, even in the newest text-books on the pathology of the eye, I have been looking for it in vain.

The definite knowledge that a gumma may form in the optic nerve itself, between the chiasma and the eyeball, seems to be of considerable clinical value and apt to explain some dark features in cases of syphilitic atrophy of the optic nerve.

The history of the case is unfortunately not known. According to Dr. E. Tiedemann's statement, to whose kindness I owe the specimen, the patient, a middle-aged laborer, was brought to the St. Louis City Hospital in a moribund condition and died a day or two later. The post-mortem examination revealed gummata in large numbers in the brain, the lungs and heart, in fact, in almost every important organ.

In the left optic nerve, about one-half inch in front of the chiasma, there appeared a round swelling about the size of a pea, which, considered to be a gumma of the optic nerve by analogy, proved to be such by microscopical examination. (Fig. 1.)

Fig. 1.

From the accompanying photograph it will be seen that the tissue which represents the nerve, forming in the transverse section a flat oval, is surrounded by a ring of dense connective tissue in which a great many bloodvessels lie embedded. Some of these are surrounded by large clusters of leukocytes, others show the signs of proliferating endoarteriitis and periarteriitis, and some are totally obliterated.

The nerve proper, or at least what represents it, is a mass of poorly staining small round cells in which lie embedded islands of degenerated nerve fibres. These latter can no longer be in any way demonstrated, but the configuration still shows something similar to the normal arrangement of the optic nerve fibre bundles. A not inconsiderable portion of this tissue shows evidences of former hæmorrhage. In this mass of disintegrating tissue a few characteristic giant-cells are found, also a large number of diseased bloodvessels.

The specific endoarteriitis and periarteriitis is especially well seen in the portion of a very large artery, either the arteria ophthalmica or one of its larger branches, which has remained adherent to the nerve. This can be recognized in Fig. 1 in the little appendix below the nerve and in Fig. 2

Fig. 2.

under a higher power, where the immense number of layers of newly formed cells and the wavy lamina elastica are plainly seen.

The whole tissue stains but poorly, and, so to speak, in patches, showing that all the tissues concerned in the gumma are more or less devoid of nutrition and were doomed to death, even had the patient lived.

NEW ATTEMPTS TO CURE CATARACT WITHOUT OPERATION.*

By Prof. L. de Wecker,

PARIS, FRANCE.

(Translated by A. Alt, M. D)

THANKS to the possibility of letting strong remedies act directly upon the tissues of the eye by means of injections, attempts to prevent or to cure cataract in its incipiency have of late been resumed. In my opinion, that is all that can be attempted with our present knowledge of the anatomical lesions of the eye which lead to dimness of the lens. We know that in the very beginning there is simply a separation of the lens fibres with an unequal distribution of the nutritive fluid between the separated fibres. This displacement, due to the disassociation of the constituent parts of the lens, is sufficient to produce very pronounced opacities and to occasion quite a degree of obscuration of vision, but it is not unreasonable to admit that, without such lesion and without destruction of the constituting elements of the lens, it might be possible in some measure to put things to right again and thus to cure a beginning cataract, or at least to arrest the further progress of opacification.

The question is quite a different one when the cataract has progressed to such a degree that we have to deal with the destruction and softening of the fibres or with their shrinkage and an advanced sclerosis, that is, if we try to get rid of a cataract which has become complete. It is true that nature with her spontaneous curative resources shows us in this affection how she can put two distinct processes into operation to restore the lost vision. In one (applying to the first mentioned form, the cortical cataract) such a liquefaction of the cortical substance takes place that it may be totally absorbed and that the small nucleus sinks to the lowest parts of the capsule, thus rendering the pupillary area

* Annales d'Oculistique, March, 1905.

free, which then is occupied only by the two agglutinated walls of the capsule. The second mode of spontaneous cure lies in the shrinking of the subcapsuler cellular elements and the sclerosis of the lens fibres which, by thus gradually reducing in size the capsule as well as the volume of the cataract, produce a traction on the z onula and detach it. Under the influence of the weight of the cataract the latter first becomes dislocated and spontaneously sinks lower, so as to free the pupillary area from all opacity. I have observed both of these modes of cure produced by nature and have described them in my treatise (Vol. III, 702 to 929.)

In the communication which I now propose to make I shall abstain from mentioning the attempts made to arrive therapeutically at these results of spontaneous cure. I shall restrict myself to describing the attempts made with the object: 1. To prevent the formation of cataract. 2. To arrest the progress of this affection, when it has commenced, and, 3, to reduce or even disperse beginning crystalline opacities.

1. In a recent book by an experienced confrére, Mr. Dransart,* we find the following passage:

"I am very positive that it is possible to prevent the formation of a cataract in a great many cases. In fact, I believe that in many cases the cataract formation depends on a state of malnutrition, especially characterized by the imperfect elimination of urea. I have actually seen this in a great many cases. Most of the individuals suffering from cataract are rheumatics with an imperfect nutrition." Mr. Dransart concludes: "With a good general hygiene, combined with antiarthritic treatment, and a perfect hygiene of the eye by means of proper glasses, we may succeed in almost half of the cases in preventing a cataract."

Undoubtedly most cases of cataract are formed in arthritics with arterio-sclerosis, but it is going very far to say that we can prevent the formation of almost one-half of the cataracts. Nobody can deny the progress made in the treatment of arthritis, and, more especially, the perfection we have

* De la cataract dans ses rapports avec la cécité dans le Nord de France. By Dr. Dransart, Somain, p. 8.

arrived at in the correction of errors of refraction, but I do not know that even in those countries which are best supplied with prominent physicians and oculists the number of cataracts has decidedly diminished.

In spite of this, it is useful to more and more draw the attention of patients threatened with cataract to the analysis of the urine, especially for urea, the chlorides, and, above all, for sugar. It may very well be that an arthritic with arterio-sclerosis suffers from an intermittent diabetes and presents visual affections which show themselves as a change in the refraction and slight defects in transparency in the lens which may be effectively modified by an appropriate treatment. I am convinced that the repeated analysis of the urine is the best guide in the prevention and arrest of the formation of a cataract, on account of the indications for a rational treatment of the arthritic with arterio-sclerosis which is furnished by these analyses.

Here we must remember the observations which were made in the watering places intended for diabetics. The observations of Seegen and Gerhardt at Karlsbad have scarcely been credited. They found that vision improved *pari passu* with the diminution of the glycosuria, but they did not substantiate their observations by ophthalmoscopic examinations and an accurate determination of the visual acuity. This objection can, however, not be urged against the observation reported by Koenig,* which concerned a patient who, having gone through a cure at Vichy, had recovered her vision and "the absolute integrity of her crystalline lenses."

2. The second question we want to study is the following one: *Is it possible, by proper treatment, to arrest the progress of a beginning cataract?* The greatest difficulty in the way of solving this question is the fact that the evolution of a cataract does not follow any regular course, and that there may be a standstill for months and years. In my own family I hesitated to tell some of its members that they had beginning cataracts and later on congratulated myself on this, since after a period which even reached 20 years I have been

* Bulletin et memoires de la Société Francaise d'Ophtalmologie, 1902, p. 431.

able to see that the opacities had remained stationary. I have, also, always instructed my pupils to abstain from prognosticating the time of ripeness of a beginning cataract, since I have only too often heard patients deride colleagues who had predicted a fixed date for the abolition of their vision, while the opacities remained stationary, as they had been at the time of their consultation. It is undisputed that crystalline opacities may become stationary at any stage and that, if treatment had been instituted, we are not in the least authorized to apply the dictum: *post hoc, ergo propter hoc.*

The treatment which in this sense has most aroused attention is the one which Prof. Badal, in 1902, has communicated to the Congress at Paris (Compte rendu, p. 442). As our confrère says: "He has never spoken of the cure of cataract * * * , but only of arresting the evolution of this affection." Moreover, the 3 observations which are added to this communication refer only to the arrest of the progress of the cataract, and, astonishing as it is, the period of such control is no more than 9 months, 10 months and 1 year, respectively. It would be very easy for us to gather from our books a large number of cases in which, when we re-examined them after 2, 3 or more years, we found the identical visual acuity which we found at their first visit, although we had never instituted any treatment with this end in view. However, we must agree that the treatment to which our colleague at Bordeaux subjects his patients can hardly inconvenience them. It consists in the main of simple baths by means of an eyecup, morning and night, using a solution of iodide of potassium of 1 in 40, or, simpler yet, of the instillation of a collyrium of the same strength.

Badal prefers this easy treatment to the subconjunctival injections; yet, he does not prefer it only on account of the easy application of such baths and instillations, but, also, because he maintains that preparations of iodine penetrate more easily into the aqueous humor when they are applied in the manner mentioned. We might ask, of what importance the penetration of a little more or less iodine could be, since our colleague says: "The intact lens capsule seems to oppose an obstacle to the passage of the salts of iodine, and that, in

order to be able to note their presence in the lens substance itself, it is necessary to plunge the extracted lens into a saturated solution of potassium iodide; and this penetration goes on very slowly from layer to layer."

It is, therefore, not the direct action of the iodine salts upon the lens itself with which we have to reckon, and Mr. Badal asks, quite justly: "In order to act on a sick organ, is it necessary for the remedy to reach this very organ? Is it not sufficient to produce a modification which may act from a distance by means of the liquids which bring the nutrition to the tissues?"

This is the very reason why we give preference to the injections, when we want to arrive at the following desideratum:

3. The third attempt and the most recent one is to bring about *a regression and the disappearance of the opacities of the lens as soon as the cataract begins to form.*

Ever since opotherapy has come into use, I had, after the method of d'Arsonval, an extract made from the internal tissues and refractive media of the eye. This liquid, which Lagrange has later on used for injections to cure detachment of the retina (using only the extract of the ciliary body), we have employed in but a limited number of cases, which, moreover, did not stay long enough for us to form definite conclusions. We were guided by the idea that we might thus improve the nutrition of the lens by bringing to it elements lodged in the membranes and contents of the eye.

Students should again take up injections with such a fluid, or solutions of a remedy like potassium iodide, because we have the means to control their effect, not only in the ophthalmoscope and the text-letters, but because we are able to put the patient himself in a position to follow the progress or regression of their affection, either by means of a card perforated by a pin, or of Darier's advice,* who lets the patient gaze at a candle flame at 5 metres, holding 1 centimetre from the eye a biconcave lens of 30 or 40 dioptries. Thus he sees a light disc of a diameter which corresponds to

* De la possibilité de voir son propre crystallin. Bullet. de la Soc. Franc. d'Opht., Paris, 1895, p. 515.

the width of his pupil on which the smallest opacities which interfere with the transparency of the lens are visible.

Dr. Verderau,* at Barcelona, has related an observation, unfortunately the only one, in which the visual acuity rose from 1/10 to 2/3 in a comparatively short time, after he had made 18 injections of potassium iodide in a little more than two months. Although this is only one observation, it merits our attention and should prompt us to try about 20 injections in patients who desire to submit to a proper treatment in order to remedy their loss of vision, informing them that the experiment should not last more than 2 or 3 months, during which an injection should be made every 3 or 4 days.

The solution used may be that of our colleague of Barcelona, containing 5 per cent. potassium iodide, with the addition of 1 per cent. acoine, or 2 per cent. cocaine. This solution, well sterilized, is put up in little tubes containing a cubic centimetre of the solution, the ends of which are not broken until the very moment of using it. It is best to use only half a cubic centimetre (half a Pravaz syringeful) at each injection, since even this dose is quite painful; when but 4 to 6 drops are injected the patients feel no pain.

There is another precaution to be taken, that is, the injection must not be made under the conjunctiva, since such a quantity of fluid causes a chemosis, which is disagreeable to the patient, but deeper, in order to make it intracapsular, like the one for retinal detachment, because then only a small quantity of the fluid raises the pericorneal conjunctiva.

The trials made with such iodine solutions are still too new for my judgment of their value, but I think I can advise that they be employed, and that the patients who come to the physician asking whether nothing can be done to remove the cataract threatening their vision, are not systematically given a negative answer.

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* Clinique Ophtalmolog., Nov. 1904, p. 368.

SELECTED ARTICLE.

A CONTRIBUTION TO THE STUDY OF STRABISMUS, WITH ESPECIAL REFERENCE TO THE OPERATION OF PANAS FOR ITS RELIEF.

An Analysis of 225 Operations on 120 Subjects.

BY PROFESSOR EDWARD S. PECK, A.M., M.D.,

Professor of Diseases of the Eye, New York Post-Graduate Medica School and Hospital; Consulting Ophthalmologist to the City Hospital, New York City.

A proper study of strabismus, or squint, embraces not only a study of the act of deviation itself, but of the causes leading up to the deviation, the pathological processes involved in it, and the best method of overcoming it. The subject has been so thoroughly written up in monogram and manual that, to furnish another contribution seems on first thought unnecessary, if not presumptuous. At the present day, however, so much has been brought forward of interest and profit, that my attempt will be confined to emphasizing the suggestions of Donders, Javal and others as to the dependence of strabismus on the errors of refraction of the eye—a theory whose basis is a purely physiological one. To do this, a brief retrospect of the essential elements of strabismus is necessary.

What is strabismus? The word is an old Greek one, meaning squinting. Strabismus is an inability to bring the visual axes of both eyes simultaneously on one point, the axis of vision of one or both eyes always deviating in a certain direction from the object looked at. It is on the one hand the result of errors of refraction, equal or unequal in both eyes, an inequality of the meridional planes of the eyes; or, on the other hand, it may be due to imperfect innervation, weakness, or paralysis of one or more of the extrinsic muscles.

Strabismus is divided, according to the direction taken by the muscles, into convergent, divergent, upward or downward. Convergent represents about 85 to 90 per cent. divergent about 10 to 12 per cent.; upward now and then a case, while downward squint is very rare. Sometimes strabismus is of a mixed variety, as when the covergent form has associated with it an upward squint. Strabismus may be confined largely to one eye, but both eyes always participate in it, unless it be traumatic, paralytic, or consecutive to other disease. A purely monolateral squint does not exist except under the conditions just named. Strabismus may be continuous or periodic. From the standpoint of dynamics, it may be concomitant or functional on the one hand, or paralytic on the other. The terms concomitant and functional are synonymous. In his classical treatise on the "Errors of Refraction and Accommodation," published by the Sydenham Society of London, Donders first brought out the intimate connection of functional convergent strabismus with hyperopia. Donders found that, of all convergent strabismus eyes 75 per cent. were hyperopic. When one reflects that these facts were suggested before the invention of the ophthalmoscope by Helmholtz, the importance and the classical character of Donders' work may be inferred. Edward T. Ely, a pupil and later associate of our President, Dr. Roosa, and for many years until his death my colleague, wrote an elaborate and painstaking essay on the study of the refractive conditions of the eyes of the newly born, and found 80 per cent. hyperopic. Horner, Roosa, Scrini* and others contributed studies on these same lines. Later, Javal emphasized astigmatism, and the unequal refraction of the two eyes of the individual, called anisometropia, as causative factors of strabismus. It is a well-known fact, amounting almost to an axiom, that refractive error is bilateral, and usually equal in both eyes; and that, if astigmatism be present or complementary, this is usually in the same meridional plane

* Scrini: Archives d'Ophtalmologie, 1901, p. 241. found in 136 newly born 60 alternating and periodic cases of strabismus; it was greater among the children of primiparous than among those of multiparous women.

in each eye of the individual; this occurs in 80 per cent. of the cases of strabismus. We must remember that accommodation is a function of the ciliary muscle, pure and simple; that convergence is an act of the internal rectus, and is a complement of and reinforces the act of accommodation. Convergence is an extra-ocular act, accommodation is an intra-ocular act. We must also remember that astigmatism and anisometropia are purely anatomical failures, either of the cornea or lens, or both. If the concomitant character of strabismus is granted, as evolved by the elder Graefe, and by whom this name was given in the antithesis to non-concomitant or paralytic strabismus, then the first radical step in the conception of the strabismic act has been taken, viz., its character is bilateral and not monolateral; both eyes participate in it; and it is not alone a lesion of muscle and nerve, but it is a functional loss of equilibrium, due to errors of accommodation and refraction primarily, and assisted in some cases by faulty attachments of extrinsic muscles, or by a feeble innervation or absence of these extrinsic muscles, or by other anatomical or pathological vices of the orbits.

I would prefer to leave this feature of the essential causes of strabismus to others, who may care to take it up for discussion; it has played a very prominent role in scientific writings in this and other countries, with a view to the management of *positive* or convergent squint, and of *negative*, or divergent squint.

I will also leave to others to elaborate the methods of orthoptic (Javal) treatment in young children, which has proved eminently successful in many conservative hands. The work of Dr. Davis* and Dr. Derby of New York on lines formulated by Javal is most noteworthy, and deserves careful study. Do not forget that the ideal of successful treatment of any case of strabismus depends on the establishment of binocular vision, with the suppression of a manifest or latent diplopia by means of the stereoscope, excur-

*Davis, A. E., Post-Graduate, March, 1901. "Non-Operative Treatment of Strabismus; Its Possibilities." In this paper Javal's orthoptic exercises and Priestley Smith's educational treatment are detailed.

sions in motility, the exclusion-pad, bar-reading, and even atropin. It is always preferable to any operative method in very young and carefully selected cases.

In this connection, I wish to note that there have been two periods of the history of the study of strabismus. The first dates from the teachings of Stromeyer and Dieffenbach in 1838, when squint was recognized as a muscular deformity. The second was initiated by Helmholtz, and elaborated by Donders; by them, squint was regarded as on optical anomaly, and due chiefly to hyperopia and the normal habit of convergence, in which an inordinate contraction of the ciliary muscle or ciliary ligament is established. Increased nerve-impulse is imparted to the extrinsic muscles, or the interni. In emmetropia all attempts of accommodation are accompanied by convergence. In hyperopia the interni show a contractile power greater than that of the ciliary muscle. In myopia the opposite condition prevails. Hence it follows that hyperopia leads to inordinate strength of the interni—whereas myopia weakens them by lack of nervous stimulation. When binocular fixation is abandoned, convergent or divergent squint results.

As typical divergent strabismus is associated with myopia, so typical convergent strabismus is associated with hyperopia. Divergent squint, however, by exception, is oftener found with hyperopia than is convergent squint with myopia. If divergent squint is a passive act due to relaxation, non-use, or disuse, then convergent squint is an active act, and implies spasticity, and contracture of a muscle, and is usually associated with the act of accommodation.

Either theory must carry with it its own therapeutics—the first or purely muscular theory of Stromeyer and Dieffenbach, by operations on the muscles; the second, or accommodative refractive theory of Donders, by a correction of refractive anomalies.

Two years ago Claud Worth* made some characteristic observations of the subject of strabismus, which I shall reproduce in brief here. He wrote that squint is not a disease,

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*Worth: Squint. *Archives of Ophthal.* 1903, p. 509.

but a symptom. He found that 81 per cent. of convergent strabismics have perfect abduction. When the macula (by disuse) has ceased to be the most sensitive part of the retina, the eye then wanders without remaining steadily in any definite position; this is *lost* fixation; or it may fix with some part of the paracentral region, or with a point of the extreme periphery; this is *false* fixation. He further states, if an eye with a false macula be put straight by operation, crossed diplopia is produced. Congenital amblyopia is very rare, which he claims can be checked by stimulating the macula. He adds: hyperopia is one of the causes of squint, of which the principal one is a partial or total absence of the fusion-sense.

In this connection Landolt of Paris has written at great† length an ingenious and subtle argument, built upon a physiological framework. I shall take the liberty of reproducing it here, as it is a classic contribution to the literature of this subject, though its deductions as to operative work have not found acceptation even among his own confrères. In spite of his belief in the theory of Donders, that concomitant squint is a binocular affection, he writes 40 years later that, our knowledge of the anatomy and physiology of ocular muscles is still insufficient. He states that in convergent strabismus both external recti have grown weaker, while in divergent strabismus both internal recti have grown weaker. Hence follows an argument for *strengthening* the weakened muscles of a strabismic eye, instead of *weakening* the deviating muscle; that is to say, he would make an advancement of the external recti muscles in convergent strabismus, and of the internal recti in divergent strabismus. He recognizes that tenotomy of the deviating muscle is easier, but argues it is not physiological. The centre of rotation of the eyeball is not fixed, as has been asserted, but is movable; it is due to the resultant effect of all the forces which hold the eye in postition, and which move it. One of the functions of the four recti muscles is to retract the eyeball, while the oblique muscles draw the eye forward. If tenotomy of a deviating

†Landolt, *Archives of Ophthal.* 1897, p. 5, *Ibid.* Norris and Oliver, vol. iv. pp. 1 et seq.

rectus muscle weakens it, then the oblique muscles increase their power, and pull the eyeball forward, so that it projects beyond its normal plane. This is one reason why a tenotomized muscle reattaches further back on the eyeball; another reason of greater weight is that found in the rotation of the eyeball, which displaces the axis of fixation further outwards, and away from the vertical plane, by contraction of the untouched antagonist muscle. Projection of the eyeball forward is further increased by the fact that the tenotomized muscle contracts more than its antagonist because, the muscle being detached, only the check-ligaments, or Tenon's capsule, which follow the course of the recti muscles, run towards the orbital margin. Landolt argues that the mobility of an eyeball must suffer after tenotomy, and adds that the success of a tenotomy depends on this loss of mobility. An antagonist never gains as much as a tenotomized muscle loses. By a tenotomy the muscle-cone loses its previous proportions, and the muscles forming this cone embrace it less than before. On the contrary, advancement of the antagonist forces the eyeball deeper into the apparatus, or zone, of motility; and, on account of this retrogression of the eyeball, advocates of advancement are wont to argue the increase of motility of an eye.

The argument is a specious one, though based on well-established physiological laws, and well-known anatomical facts; but its author possibly forgets that, in a tenotomy of the internal rectus for convergent squint, a certain amount of projection being admitted, three long recti muscles remain, whose conjoined efforts in maintaining the muscular zone are nearly equal to the contracting power of the internus; the ratio of dynamic power of the rectus externus to the rectus internus is 1:5 or 6, and that of the superior and inferior recti is 1:7 or 8. In addition, the power of the obliqui to propel the eyeball forward is exceedingly slight. It is also well known that the perimetric field of vision of an eye is but little constricted three or six months after a complete tenotomy of the internal rectus; the excursion towards the nasal limits remains at about 45° or even more. It is, furthermore, an admitted

fact that Landolt, accomplished scientist as he is, performs tenotomy of a deviating muscle oftener than an advancement of the antagonist. For no one recognizes better than he how much more difficult of execution is an advancement operation, and how many more important operative features there are to overcome in it. The nicest quality of exactness in measurement, as well as the most perfect instruments, are required. I fear, if those of us who relied upon advancement pure and simple for the rule of our procedure in convergent squint, laid the bare facts to view, it would be found that we sought an accessory tenotomy to complete an otherwise unfinished operation. I have introduced Landolt's arguments because they were ingenious, were based on physiological principles and anatomical facts, have found many followers, and were published in one of the most scientific and conservative archives of our day.

In undertaking the intelligent care of a case of strabismus, knowledge of the insertion of each rectus muscle to the eyeball is necessary.

The *internal* rectus is inserted 5.5 mm. from the inner corneal margin; it directs the eye strictly inward. It is the shortest, the broadest and the strongest of the four recti.

The *inferior* rectus is inserted obliquely 6.5 mm. from the inferior corneal margin; it directs the eye downward and inward; it is shorter than either the superior or external rectus; it is stronger than the superior, but is weaker than the external rectus.

The *external* rectus is inserted 7 mm. from the external corneal margin; it directs the eye strictly outward; it is larger than the inferior, but shorter than the superior rectus. It has two heads of origin at the common ligament of Zinn, and the foramen lacerum posterius.

The *superior* rectus is inserted obliquely 7.5 mm. from the superior corneal margin; it directs the eye strictly upward; it is the longest and the weakest rectus muscle.

The *superior* oblique directs the cornea of the eye downward and outward. The *inferior* oblique directs the cornea upward and outward.

Strabometry, or the Measurement of Strabismus.—It is necessary to determine the angle of strabismus, and the same methods apply to all forms of strabometry. What is the angle of strabismus? It is the angle comprised between the direction which the line of sight of an eye has and that which it ought to have. The angle of strabismus is then the amount or degree of deviation. We must know not only the *qualitative* analysis of strabismus, but still more the *quantitative* analysis. There are a number of methods, but those chiefly in vogue as most practical are first, by a linear strabometer, such as Lawrence's single ivory shield, or Landolt's parallel sticks; second, by a graduated semi-circle, such as a perimeter, or ophthalmotrope or tropometer; these are more exact than the linear strabometers, and more expensive. Foersters' perimeter, Landolt's ophthalmotrope, or Stevens' tropometer, will answer the purpose; third, subjective strabometry, or that test which is based on the principle of the base-line between double images being the tangent of the angle of strabismus; Donders employed this method largely; fourth, the method by prisms, which is based on the principle that luminous rays passing through a prism are deflected towards its base, or thicker portion, and away from its edge or thinner portion; and that objects looked at through a prism are seen displaced towards the wedge, or prism-angle.

Of these, the two most popular and accurate methods of measuring a strabismus are by means of the ophthalmotrope, or tropometer, and by means of the prism.

One word in regard to the use of prisms for this purpose of measurement. Luminous rays, which would not otherwise reach the fovea centralis of the macula of a deviating eye, are made to fall direct upon it; at the moment of this physiological act, images of diplopia are fused so to speak, or rather are superposed, in such a way that single vision results; the degree of strabismus is equal to one-half the degree of the so-styled correcting prism; for the prism fuses the diplopic images, and functionally puts an end to the strabismus. Prisms are liable to error in this way; if too weak, or if weaker than the angle of strabismus, the double images are brought nearly up to the point of fusion, when the tendency

to binocular single vision is aroused in the individual, and the paretic muscle attempts to fuse the two images and fails; or if the prism be too strong, the images first fuse and then cross, and the paretic muscle finds itself powerless to restore the fusion-point with success. The proper correcting-prism is the one which stimulates and maintains the fusion of the double images. Of these methods, the prism-test is the most physiological, the tropomete is the most practical. All define the measurement of the angle of deviation and express its definition in degrees.

The true language of displacement should be in degrees and not in lines or millimeters, as we are too much in the habit of employing. Expression of the deviation of an eye is an expression of the value of an angle; it should not be expressed in lines, inches, or millimeters, as English-speaking races are prone to do, but always in degrees. Displacement is not along a line, but around a plane of rotation and fixation, whether that plane be vertical, as in convergent and divergent squint; or horizontal, as in upward and downward squint. We must not forget, as was said before, the tendency of patients with deviating eyes to fuse double images. We may find that the degree of strabismus is less than the degree of diplopia by 1° or 1.5°. This is the secret of orthoptic treatment; and its success is based on the proper selection of prisms, as first used, to establish fusion-images. Du Bois-Reymond first suggested the service of the stereocope in the treatment of strabismus, but Javal put the principles into practical service in ophthalmology.

Operative treatment having been decided upon in a given case of strabismus, I assert with emphasis that no operator, however practiced or clever he may be, undertakes operative interference for its relief by any method without feeling much anxiety as to the results. This anxiety is not on account of over-correction of the deviation, but on account of under-correction. As to success of correction, I have never been able to appreciate the emphatic "caution" of text-books, not to cut too much, as an excessive operation, or a squint in the other direction, might result. In a series of nearly 3,000 cases I have never seen this result but 10 times, and those

cases were seen in from one to 20 years after the operation. Two of these were patients who promptly developed neurotic or psychic symptoms, due to heredity. The anxiety to which I allude is that the relief of strabismus will not be complete in one session, or that an under-correction will follow. This statement may be made in varying degree of all the methods of *simple* tenotomy. The best methods hitherto in vogue have been brought forward by Arlt, von Graefe, Critchett, Snellen, Prince, Stevens, Schweigger, and others; and of these operations, more or less original, there are manifold modifications. They are all modeled after the operation of Dieffenbach, which in 1839 was the first operation performed on the living human subject. The suggestion came from Stromeyer, and was inspired by his results in myotomy on the cadaver in 1838. Guerin at the same time made a subconjunctival myotomy of the internal rectus muscle with a sharp-pointed knife, cutting upwards against the rectus tendon just as Stromeyer severed the tendo Achillis by a subintegumental incision.

Objection may properly be made to any method which involves the necessity of repetition, and sometimes multiple repetition. The "dosage of tenotomy" is itself a malady to be cured. None of these methods offers in advance any definite guarantee of full, complete success in one session. The operation of Professor Panas, of Paris, offers the greatest possible guarantee of success by one intervention. I offer a liberal translation of his own communication to the Academy of Medicine, Paris, session of July, 1898. It was his second paper on this subject, and is published in full in the *Archives d'Ophtalmologie*, July, 1898, p. 401. The patient being chloroformed, the usual antiseptic means are employed, by preference a solution of biniodide of mercury, so universally used in Paris hospitals. The conjunctival fold is seized horizontally over the rectus tendon, and tendon and subconjunctival fascia are incised. A short strabismus hook is introduced deeply into the buttonhole, and by a brisk movement in circumduction, tendon and tendinous envelope are embraced within the hook. Holding the loaded hook up in the air, slowly progressive tractions are made

without jerks or twitches, until the inner border of the cornea attains without much resistance the external lid commisure. Panas never succeeded in making the least rupture of the tendon of the muscle under traction—an accident not likely to be made when one recalls that, with a weight of five kilogrammes (about 10 lbs.), the muscle of dogs could not be broken. Spasmodic jerks must not be made, as a feeble muscle might be broken. Having completed the elongation of the muscle, one proceeds in the usual way to a complete tenotomy of the tendon down to the surface of the sclerotic; to be assured that no adhesion or tendon remains, the hook is passed to the upper and lower border of the muscle, and every remnant of tendon or attachment to the sclera is cut free. The hook is then released, bleeding checked, and the conjunctival wound is closed by a suture of catgut, and the conjunctival sac irrigated. Precisely the same procedures are carried out immediately on the other eye.

At first, under fear of an over-correction, especially when the deviation was mild, not exceeding 10° to 15°, traction was limited to the eye with fixed strabismus, while a simple tenotomy was made on the other eye; but clinical experience gave overwhelming proof to the author of the operation that elongation of the muscle in each eye was a condition of success; and since then he has always executed this double procedure. Both eyes must be kept bandaged 24 to 48 hours. Aside from a small amount of ecchymosis at the point of traction and tenotomy, conjunctiva and sclera preserve their normal aspect; in five or six days, when the suture either falls out or is absorbed, cicatrization is perfect. After a proper correction of the ametropic and astigmatic errors, usually present in such cases, patient is discharged about the 10th day. In order to the perfect establishment of binocular vision, exercises by the stereoscope or other orthopic means should be begun and continued a long time with intelligence and persistency. Such is the description given by Panas of this simple operation. The salient points are two: first, the operation must alway be done on the two eyes simultaneously; second, elongation and tenotomy of the same muscle must be complete.

Panas' first figures were briefly as follows: He operated on 220 subjects, of whom 210 were cases of convergent and 10 of divergent strabismus. Of the 210 convergent squints, 180 had complete and immediate parallelism, while in 30, or in 1/7, a certain degree of convergence remained. Three-fourths of his patients with convergent squint were among children of 5 to 16 years of age; about one-fourth were individuals between 16 and 30 years of age; 12 were emmetropic and almost all the remainder were hyperopic, usually unequally so in both eyes, and usually accompanied by direct or inverse astigmatism. Fifteen of the convergent 210 were mildly myopic, except one individual, who had a myopia of 4 D. As is the rule, so with his cases, the fixed strabismic eye was the more ametropic of the two. The angle of deviation varied from 10° to 30°. None showed a persistent over-correction.

Of the 10 divergent squints, the recoil of the externi after elongation and division was complete in eight cases; in those cases the angle of strabismus was under 25°, and the recoil was sufficient to overcome the angle of diplopia and of divergency, while in the two other cases, having an angle of 25° to 30°, a capsular advancement of the opposing interni was made at the same time with ultimate success. Of these 10 divergent cases, those from 20 to 25 years of age with a divergence of 25°, 30° and 35°, received the operation by elongation and tenotomy of the two externi, and later advancement of the two interni. Every operator knows how much operative correction of concomitant divergent squint leaves to be desired; how unsuccessful, or, at best, how half successful these interferences are.

I have refrained from a further elaboration of Panas' tables on account of the necessity of brevity. The reader must study them for further purposes. I think it requires no stretch of the imagination to argue a real progress over previous methods of simple tenotomy on one or both eyes.

In the *Post-Graduate Monthly* of March, 1900, under the title, "Results of the Panas Operation for Strabismus," Professor Roosa contributes a report of 40 cases, 25 operated on by himself, 14 by Dr. Martin, of the Manhattan Eye and

Ear Hospital, and one by Dr. A. E. Davis. In brief, his summary is as follows: "Perfect results" or parallelism in 34 cases out of 40. Roosa further had an "entirely satisfactory" result in two other cases operated on within the month of his writing. His own cases, 27 out of 42, had been carefully followed and estimated by himself, some of them for over a year after the operation; he regarded the conditions observed as approximately final. In Dr. Martin's 14 cases, operated on during his House Surgeonship at the Manhattan Eye and Ear Hospital, 11 preserved parallelism, 2 showed a "slight convergence," and one showed a "very slight divergence." In the single case of Professor Davis, a "slight divergence" existed 3 months after the operation. Roosa had out of 27 cases only one with imperfect results—that was a child of 3 years "who had lost the power of fixation" before the operation; in this case the squint was "entirely overcome, but the power of fixation in one eye is still not perfect." In brief, in 42 cases, there were 38 perfect results; two under-corrections and two mild over-corrections. Roosa's contribution has been republished in the *Archives d' Ophtalmologie.*

In a subsequent paper, in the *Medical Record*, May 3, 1902, p. 687, and later reviewed in the *Post-Graduate Monthly* under the title, "Functional and Paralytic Strabismus," Roosa pleads for a proper understanding and nomenclature of strabismus as a bilateral, and not a monolateral disease. Cases of paralysis of one or more of the recti muscles of an eye, depending upon an anomalous position of the macula lutea may produce a strabismus that is really monolateral; and these cases can be straightened by various orthoptic or educational measures; these may, or may not, be the results of central encephalic or spinal lesion. Roosa quotes the late Dr. Agnew, who for many years was accustomed to teach his pupils that it made very little difference which eye is cut at the first session; his idea being that true functional strabismus was bilateral. Roosa's 42 cases (including Martin's and Davis' cases) are presented in tabular form, and are very interesting.

In a communication to the Academy of Medicine, of

Paris, published under the head of new statistics of the operation for strabismus in the *Archives d' Ophtalmologie*, 1901, p. 305, Panas reviews his own statistics of 210 cases of convergent squint, 10 cases of divergent squint, also Roosa's 42 cases.

I shall detain you but a moment with his introduction of Terrien's cases in the ophthalmic service of the Hotel Dieu. There were 68 operations, 58 for convergent and 10 for divergent squint, a remarkable disproportion in favor of the divergent variety, and showing a large amount of myopia. Sex was about evenly divided, as it always is. As to age, 45 of the 58 convergent cases were from 5 to 20 years old; 10 cases were from 20 to 30 years; one was 34 years, and two were 40 years of age.

Strabismus appeared at birth, or before end of the first year of life in 10 cases; it appeared between first and second years in 13 cases; between the second and third years in 12; at six years in one case; not noted in 22 cases.

11	had an angle of strabismus of		18° to 20°.
42	"	"	20° to 30°.
2	"	"	30° to 40°.
2	"	"	40° to 60°.

1 not noted as to angle.

Of equally refracting eyes in the same individual, or isometropes, there were 21 cases; of unequally refracting eyes in the same individual, or anisometropes, there were 37 cases; that would be a very unequal division for statistics in this country; in any country outside of Switzerland or France it is a very remarkable ratio. Terrien's tables taken from the service at the Hotel Dieu, Paris, show the greatest number of strabismics to be between 10 and 20 years of age. In this clinic, as almost everywhere, it is not the practice to operate on eyes under four to five years of age—and perhaps not under six years of age. It is a well-recognized fact that many forms of strabismus are modified, lessened, and end in a complete or almost complete disappearance in the first years of life on account of the cranio-facial development. These are the years of selection for orthoptic exercises and judicious correction of ametropia and astigmatism. If suc-

cess does not follow our efforts in these years of early youth, then surgical interference must be resorted to.

The suggestion to begin a series of operations for the relief of strabismus by the Panas method came to me through our distinguished President, Professor Roosa; I cannot thank him sufficiently for the inspiration of that suggestion.

With your indulgence I will give a brief synopsis of my cases, and will say that the number of patients was 120, on whom 225 eyes were operated on by Panas' method; 15 individuals were operated on as to one eye, and 105 individuals as to both eyes. These 15 individuals had elongation and tenotomy of one deviating internus muscle only under fear of over-correction; of these 15 persons, eight have received traction and tenotomy of the opposite internus at a second session, while 105 persons received traction and tenotomy at the initial session. Of the 120 individuals, 110 were cases of convergent, and 10 of divergent strabismus. The youngest was two years and four months; the oldest 59 years of age.

3 were under 5 years.
20 were between 5 and 7 years.
25 " 7 and 10 "
38 " 10 and 20 "
24 " 20 and 30 "
5 " 30 and 40 "
3 " 40 and 50 "
1 was a woman 53 years, widow.
1 was a man 59 years, widower.

Of the 120 individuals 67 were females, and 53 were males.

I am unable to give correct figures of the time of first appearance of the strabismus; relative statistics on this point are as follows, and they are based on the statements of parents or sisters, and, as such, are only relatively correct; 25 were stated to appear within the first year of life; 35 between the first and second years; 30 between second and fourth years; 2 between the fifth and eighth years; one at the 36th year, following typhoid fever; six at or about the development of puberty, and 21 were not noted.

Angle of strabismus.

16 had an angle of 10° to 15°.
25 " " " " 15° to 20°.
39 " " " " 20° to 25°.
18 " " " " 25° to 30°.
10 " " " " 30° to 35°.
5 " " " " 35° to °40.
2 " " " " 47°.
1 " " " " 48°.
1 " " " " 50°.
1 " " " " 58°.

Refraction of Both Eyes.—There were 74 patients with equally refracting eyes, or isometropes, and 46 with unequally refracting eyes, or anisometropes. Of the 74 isometropes, 65 were hyperopic and 9 myopic; none of these myopes had less than 1.5 to 2 D., and one showed 6 to 6.5 D. of myopia. The tables will show in detail the quantitative definition of hyperopia and myopia among these isometropes; as also the quantitative definition of refraction and astigmatism among the anisometropes.

Of the 110 patients with convergent strabismus, there were 98 immediate and permanent results as to parallelism by traction and tenotomy made in one session; there were 3 over-corrections, 2 of which occurred 2 years ago, and have assumed parallelism without operative interference, and the third patient has disappeared; there were nine cases of under-correction, 3 of which have been cured by a simple advancement of the external recti, 1 by 1 stitch and 2 by 2 stitches on each eye; 4 have been cured by reopening of the conjunctival wound within 2 weeks after the initial tenotomy and by incision of some capsular-remnants, and always on both sides; while the other two cases still show some convergence.

Of the 10 cases with divergent strabismus, 9 showed immediate perfect results, the first one having been performed 30 months ago; the 10th case with amblyopia due to myopic choroiditis was imperfect, and was reinforced immediately by the tucking advancement of the interni of my colleague, Prof. Valk, and was a perfect success.

Incidents of the 120 Operations.—General anæsthesia was used in all patients under 10 years of age, except in five cases, or a little more than 40 per cent.; cocain and adrenalin in the remainder; general anæsthesia was usually nitrous oxide gas followed by ether. Chloroform was used in five cases under six years of age.

In one instance the internal rectus muscle was ruptured; it was followed by a marked and immediate propulsion of the eyeball forward, by rapidly increasing amblyopia (10/200 vision), general fever, recovery in six days; final vision of this eye was 20/30; previous vision was 20/100. A perfect recovery from strabismus resulted without interference. In one instance the external rectus was ruptured, the muscle being very small. Valk's buckling advancement was used, and recovery from a divergent squint resulted. No other untoward accident attended the other operated cases.

It is not necessary to elaborate here the causes of amblyopia, either of mild or severe form, in the list of those who presented them.

There are many most interesting scientific and clinical questions that arise out of this subject of strabismus, to which I shall simply allude in this connection. For instance, the displacement of the fovea centralis in false fixation of the strabismic eye; the relation of the angle of strabismus to the degree of amblyopia; the relation of the angle of strabismus to the dynamic power of the muscles involved in the deviating act; the alleged propulsion of the eye forward due to tenotomy; the alleged retraction of the eyeball backward, due to advancement. At what earliest age of infancy may strabismus be developed? Does functional congenital strabismus exist?

On the side of clinical interest I will suggest the following inquiries: How long may stereoscopic efforts be employed with a hope of ultimate success? In the Panas operation by traction and tenotomy, how long may a muscle be safely held in tension by the hook? How often may traction be made to insure a successful result by one intervention? These are practical clinical inquiries which are determined by the age of the patient, length of time of the strabismic act, the degree of deviation, and the experience of the operator.

Mr. President, in closing this presentment I find no need of arguing what seems to me a foregone conclusion as to the superiority of Panas' operation for strabismus over every other one, so long practiced. The results of Panas, Roosa and others are too convincing on this point. I can only urge my colleagues and those who practice ophthalmology, to satisfy themselves as to the deductions here made.—*The Post-Graduate.*

ABSTRACTS FROM MEDICAL LITERATURE.

By W. A. Shoemaker, M. D.

ST. LOUIS, MO.

SEPTIC THROMBOSIS OF THE CAVERNOUS SINUSES.

E. C. Ellett (*Jr. Am. Med. Ass.*, Dec. 17) records three cases, and discusses this condition on account of the apparent eye symptoms. The disease being rare, the actual condition is liable to be overlooked at first until it is called to mind, when the diagnosis is not difficult. The general symptoms are those of sepsis under any circumstances. The local symptoms are those due to (a) venous obstruction, causing œdema and chemosis of the affected area, viz.: the orbit, the skin of the nose, forehead, cheek, and sometimes fauces, pharynx and neck; exophthalmus, a prominent symptom being due to engorgement of the tissues of the orbit; and (b) pressure on the second, third, fourth, sixth, and ophthalmic division of the fifth nerves. The ophthalmoscope shows dilated and tortuous veins and œdema of the retina. The œdema of the lids of the second eye, beginning at the inner canthus and not due to direct extension, is important and characteristic.

The diagnosis must be made from tenonitis, orbital cellulitis and facial erysipelas. The prognosis is uniformly bad. Operation has not often been resorted to, but since the prognosis is otherwise absolutely bad, Ellett thinks that operation should be tried.

In discussing the subject, Dr. S. D. Risley made the point that when we have an infectious process, the area of which drains into the cavernous sinus, we should be on our guard for thrombosis of the sinus.

CONTRACTION OF THE VISUAL FIELD; A SYMPTOM OF ANESTHESIA OF THE RETINA IN CHILDREN.

L. Webster Fox (*Jr. Am. Med. Ass.*, Jan. 7) calls attention to a condition of the eyes found in certain children between the ages of 8 and 16, and which he designates anesthesia of the retina. It is found more frequently in girls than in boys, and generally in those who use their eyes a great deal, as in studying. In these cases the vision, both distant and near, falls below normal, often very considerably, and cannot be brought up to normal with glasses. No changes are to be found in the eyeground. A characteristic symptom is the concentric contraction of the field for all colors, but maintaining the proper relation for the different colors.

The treatment is to rest the eyes from near work and give daily applications of a weak constant electric current, one or two milliamperes "voltaic alternations."

BLINDNESS AND OCULOMOTOR PALSIES FROM INJURIES NOT INVOLVING THE OPTIC OR OCULOMOTOR NERVES.

Alvin A. Hubbell (*Jr. Am. Med. Ass.*, Jan. 7) reviews the writings of numerous medical men, and records quite a number of his own cases, a study of which leads him to believe that we may have loss of function of the optic and oculomotor nerves, caused by injury or irritation in some other part of the body, particularly in those parts supplied by the fifth, or trifacial, nerve. He holds that in many cases of injury about the face and head, followed by blindness or loss of action of some of the extra-ocular muscles, the possibility, not to say the probability, of the optic or oculomotor nerves being injured, either by laceration, contusion, concussion or extravasation of the blood, is so slight that we must look for some other theory to explain the loss of function, and he is inclined to accept the "reflex theory."